Application No.: 09/746933   Case No.: 49837US051

REMARKS

Claims 1-19 and 22-26 are pending in the application. Claims 1-12 and 25 have been allowed. Claim 13 stands rejected. Claims 14-19, and 22-24 and 26 have been withdrawn from consideration.

Applicants thank the Examiner for indicating that claims 1-12 and 25 have been allowed.

Rejection under 35 U.S.C. § 103(a)

Claim 13 is rejected under 35 U.S.C. §103(a) as being unpatentable over Knox (U.S. Patent No. 6,390,626 B2) in view of either Wilder et al. (U.S. Patent No. 3,508,809) (Wilder) or Smith (U.S. Patent No. 3,677,621). Claim 13 and Knox have been described in previous communications.

It is stated in the Office Action that Knox discloses in FIG. 15, *inter alia*, a polarization beamsplitter (220) that defines a first tilt axis and a color separation prism (530) having a second tilt axis, wherein the polarizing beamsplitter and the prism assembly are arranged such that the first and second tilt axes are perpendicular to each other. It is further stated in the Office Action that Knox fails to teach that the polarizing beamsplitter is a Cartesian-type polarizing beamsplitter, that Wilder and Smith both teach the use of a Cartesian-type beamsplitter in the form of a cube having a polarizing film disposed along a diagonal plane, and that it would have been obvious to one of ordinary skill in the art to use a Cartesian polarizing beamsplitter as taught by Wilder or Smith in order to reflect a first polarization component and transmit a second polarization component.

Applicants respectfully disagree that Knox teaches the tilt axes are perpendicular and also disagree that either Wilder or Smith teach a Cartesian polarizer.

First, regarding the issue of the tilt axes, please refer to FIGs. 2a and 2b of the present application, reproduced below. In each figure, the polarization beamsplitter (PBS) is labeled as element 32 and the tilt axis of the PBS is the axis labeled 56. The color prism is labeled as element 36 and the tilt axes of the color prism are the axes labeled 58. In FIG. 2a, the PBS tilt axis 56 is <u>parallel</u> to the color prism's tilt axes 58. The result of this configuration, with parallel

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tilt axes, is that the reflection plane of the PBS is parallel to the reflection plane of the color prism, the reflection plane being that plane containing the central rays of the incident light and the reflected light. Using the co-ordinate system added to the figure, the tilt axes of the PBS (56) and the color prism (58) are parallel to the z-axis and the reflection planes are parallel to the x-y plane.

Figure 2a
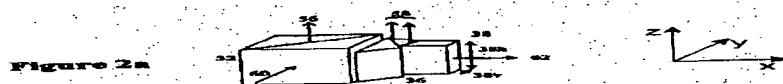
FIG. 2a from the present application

In FIG. 2b, the PBS tilt axis 56 is _perpendicular_ to the color prism's tilt axes 58. The result of this configuration, with perpendicular tilt axes, is that the reflection plane of the PBS is perpendicular to the reflection plane of the color prism. Using the co-ordinate system added to the figure, the tilt axis 56 of the PBS is parallel to the z-axis while the tilt axes 58 of the color prism are parallel to the y-axis. Also, the reflection plane of the PBS is parallel to the x-y plane, while the reflection plane of the color prism is parallel to the x-z plane.
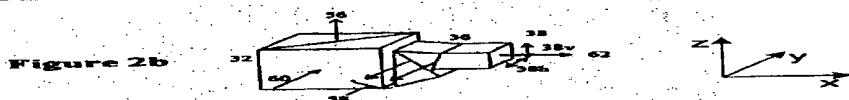

Figure 2b

FIG. 2b from the present application

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_ ....gh. ...ough .... JJ2 (col. 11, lines 28-30).
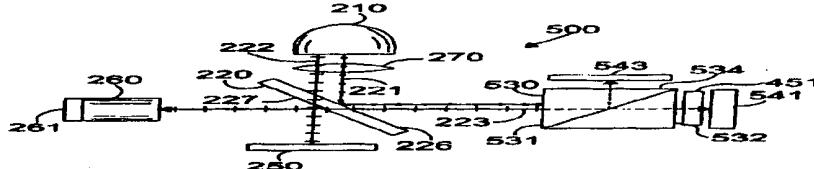

FIG. 15

FIG. 15 from Knox ('626)

The tilt axes are clearly parallel in this arrangement. The PBS is arranged so that its reflection plane is parallel to the plane of the drawing. Likewise, the prism is arranged so that its reflection plane is parallel to the plane of the drawing. Accordingly, the tilt axes are parallel, not perpendicular.

In previous office actions, the rejection based on Knox has been directed to the arrangements illustrated in FIGs. 13 and 17. This current rejection, presented for the first time

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the present office action, is based on the arrangement shown in FIG. 15. It is unclear as to why the Examiner understands the arrangement of FIGs. 15 to be different from those of FIGs. 13 and 17 in any way that is meaningful to the claims. In all cases shown in Knox, the tilt axes of the PBS and the color prism are parallel, as is evidenced by the fact that all the reflection planes of the PBSs and color prisms, in every arrangement, are parallel. The Examiner is respectfully requested to specify how the tilt axes of the arrangements shown in FIGs. 13 and 17 are configured any differently from that in FIG. 15.

Neither Wilder nor Schmidt rectify the deficiency of Knox. Wilder teaches a high efficiency light polarization system that includes a light filament (4), a light retarder (16), and a polarization beamsplitter (20) having a polarized interference filter (28) between two sheets of glass. Wilder does not teach the use of a color prism. Schmidt teaches an optical field flattening device that includes a "Swan cube assembly" (100), formed by two Porro prisms (2 and 3) with a stack of dielectric films (8) in between the prisms. Again, Schmidt does not teach the use of a color prism.

Accordingly, none of the proposed references, either individually or in combination, teach or suggest a system where the polarization beamsplitter has a tilt axis that is perpendicular to the tilt axis of the color prism.

Regarding the second issue, neither Wilder nor Schmidt teach or suggest the use of such a Cartesian PBS. Instead, the PBSs taught in Wilder and Schmidt are conventional PBSs, sometimes referred to as MacNeille PBSs. These PBSs are formed using a stack of dielectric layers that act as a polarization interference filter (Wilder col. 2, lines 49-54; Schmidt col. 2, lines 34-38), as was originally described by MacNeille in U.S. Patent 2,403,731. This type of PBS relies on the light being incident on the filter layers at Brewster's angle. Consequently, the polarization directions of the reflected and transmitted light are defined by the direction of incidence on the MacNeille PBS.

In contrast, a Cartesian PBS is a completely different class of PBS, that has a _structural_ orientation that defines fixed polarization axes (application, page 8, lines 4-5). Consequently, the polarization of the separate reflected and transmitted beams is referenced to invariant, generally orthogonal principal axes of the PBS itself, and not to the direction of incidence on the PBS

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(page 7, lines 16-17).   Accordingly, neither Wilder nor Schmidt teach or suggest a Cartesian PBS.

Since the proposed combinations of references fail to teach or suggest all the elements of the invention of claim 13, claim 13 is allowable over the prior art.

The Examiner is respectfully requested to reinstate all withdrawn claims that depend from claim 13, claims 14-18 and 26, and to allow these claims also.

Respectfully submitted,

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